



Giovanni-4: The Next Generation

*C Lynnes, M Hegde, C Smit, D DaSilva, K
Bryant, P. Zhao, Z. Liu, S. Shen,
A. Savtchenko, W. Teng, J. Wei, J. Acker*

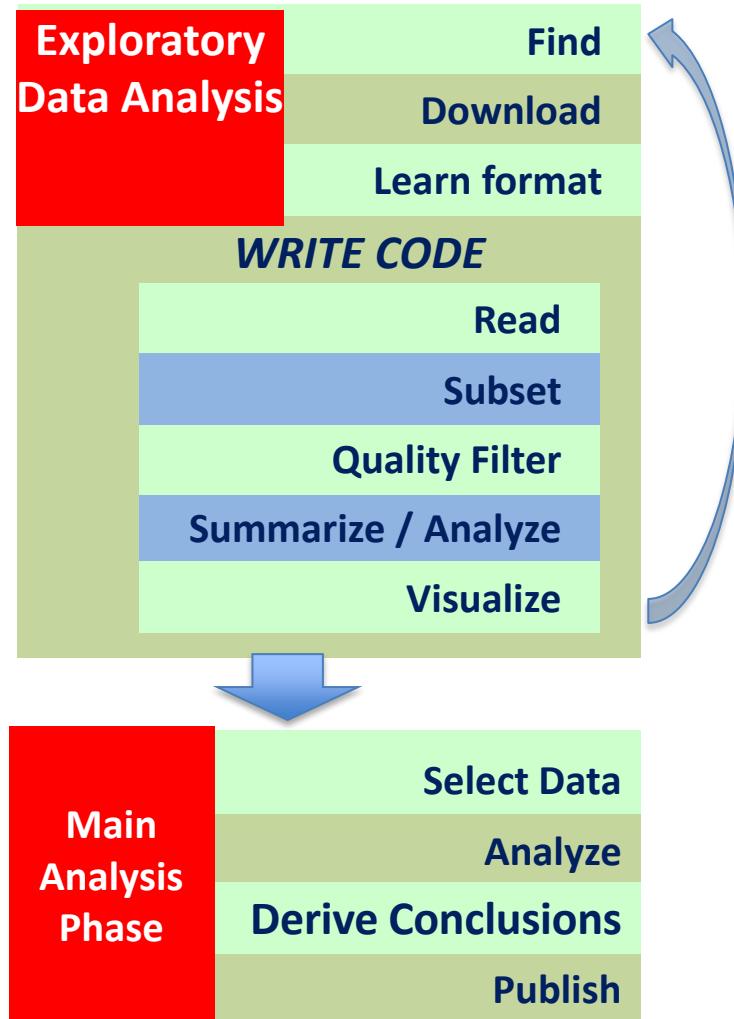


Outline

- Overview of Giovanni
- New and Notable Features
- Discussion?

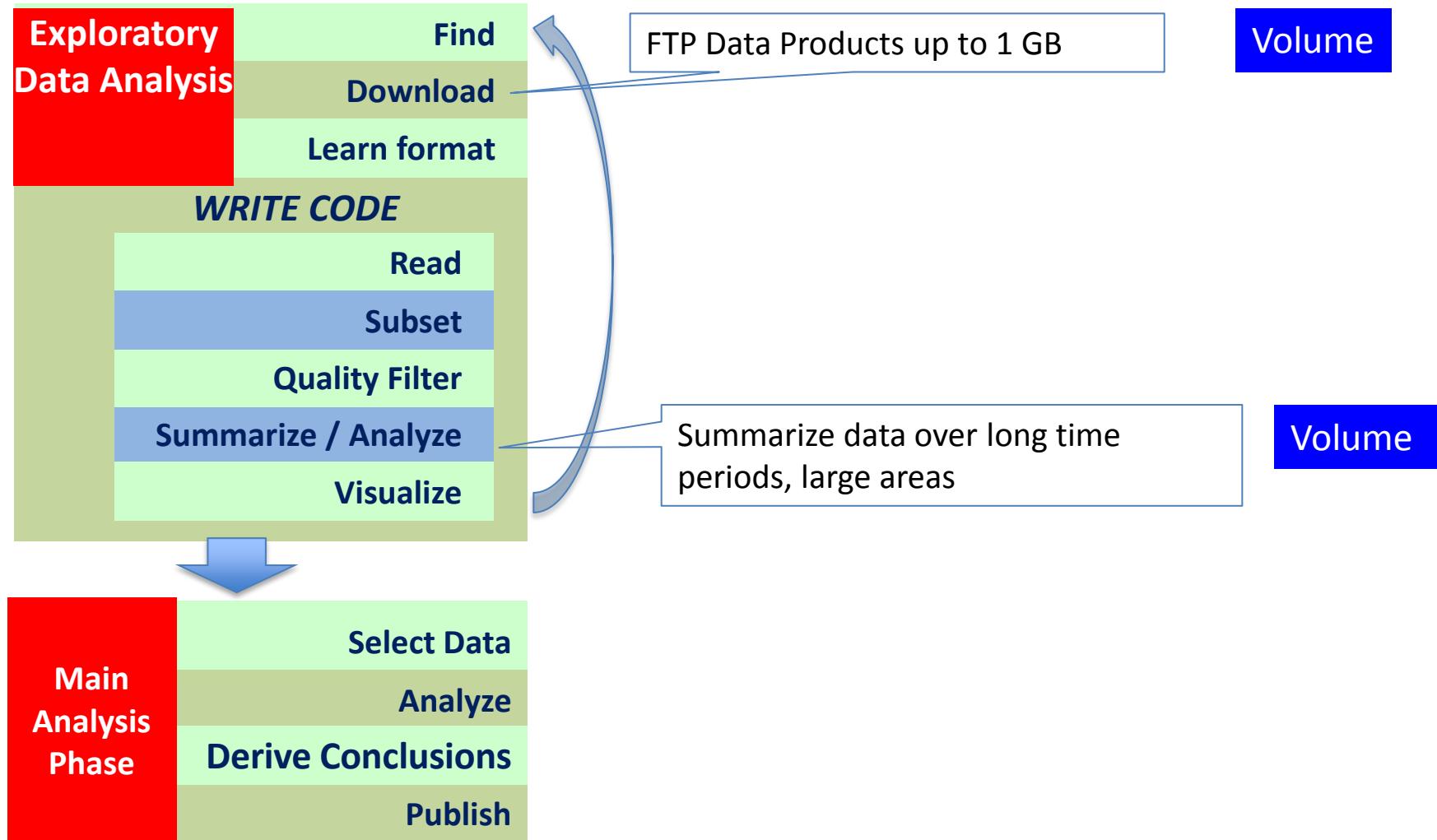


Giovanni and “Big Data”



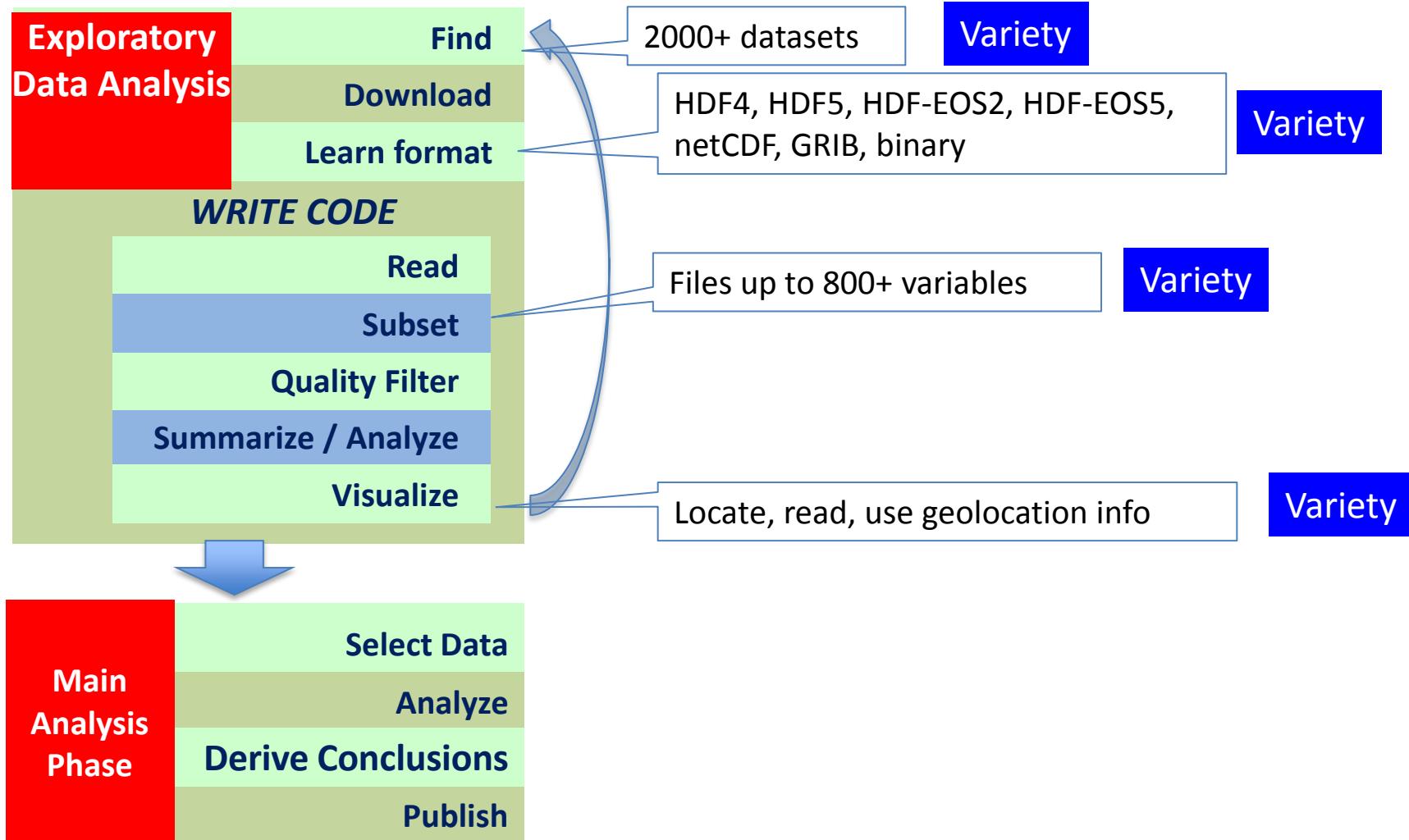


Why So Difficult?



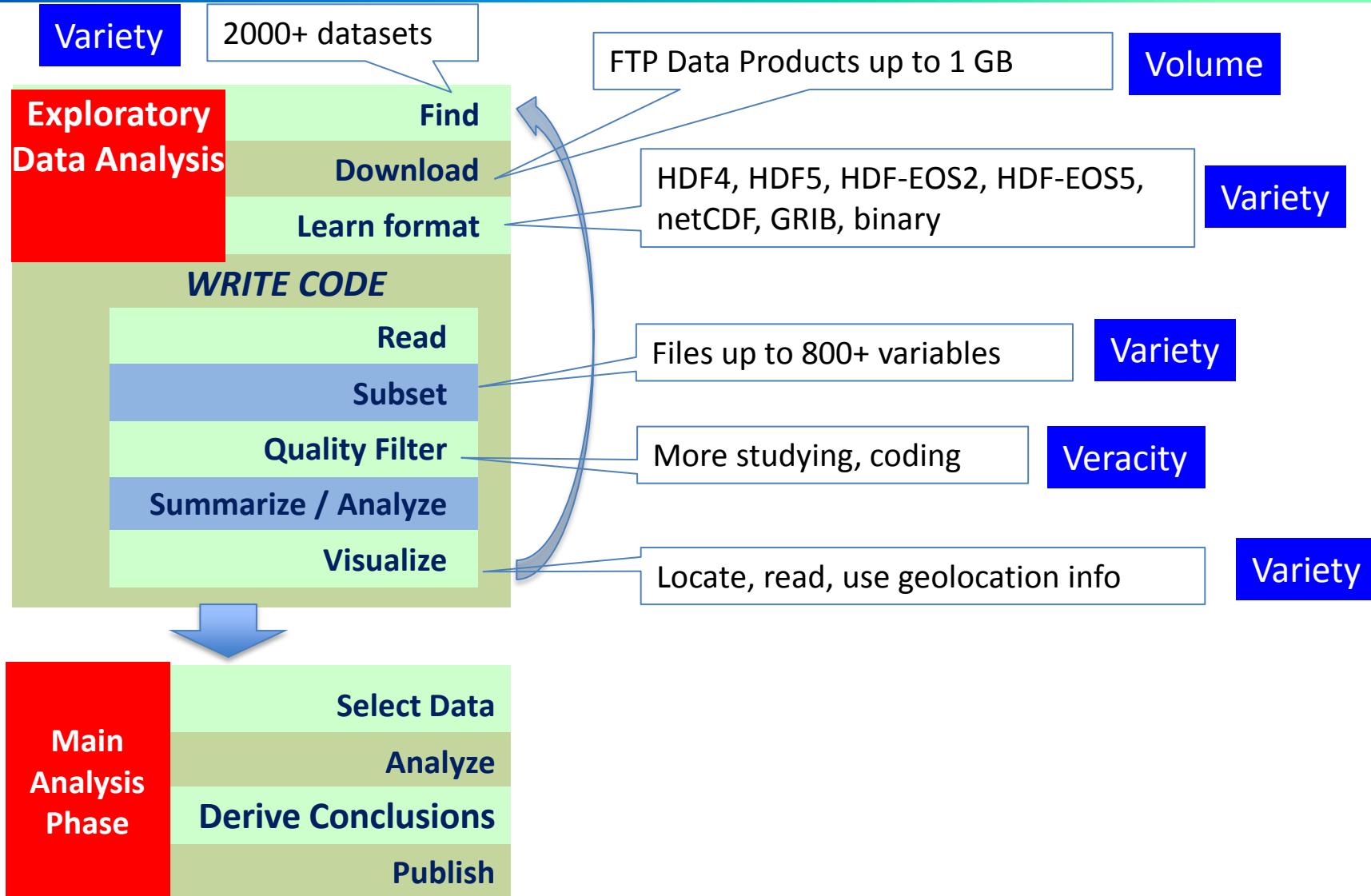


Why So Difficult?



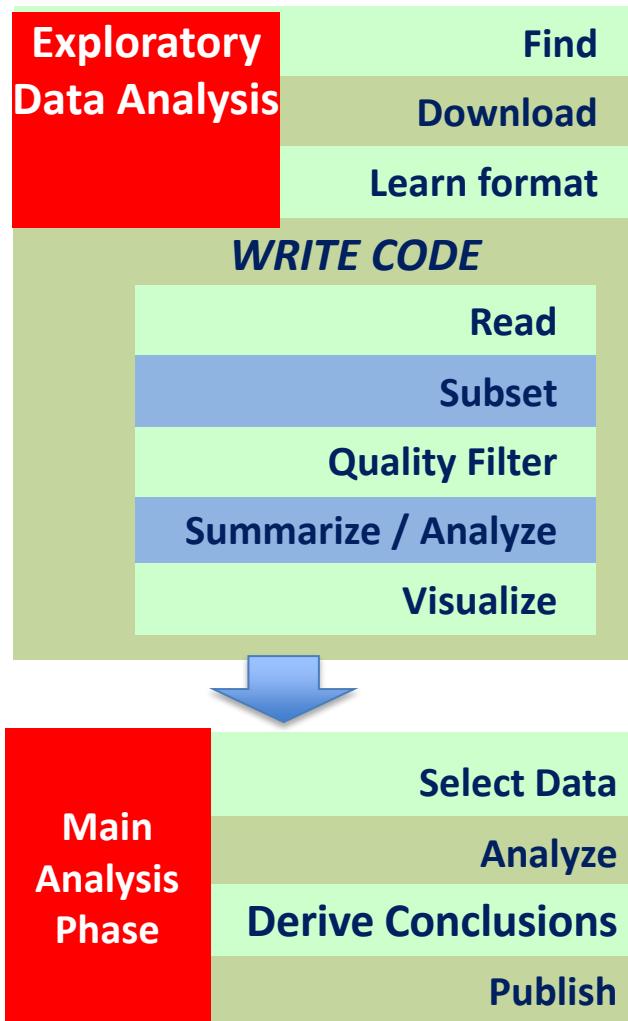


Remote Sensing Science: Why So Difficult?

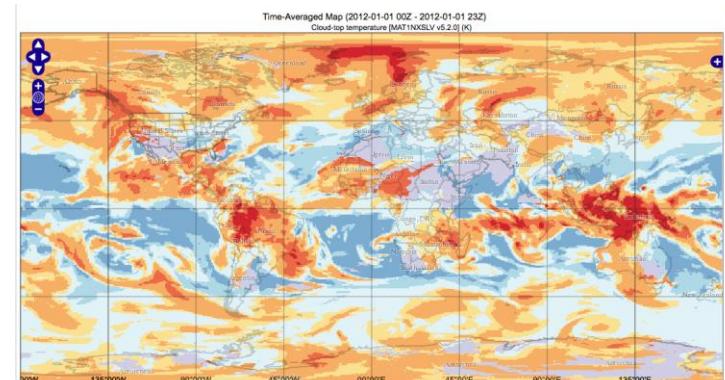
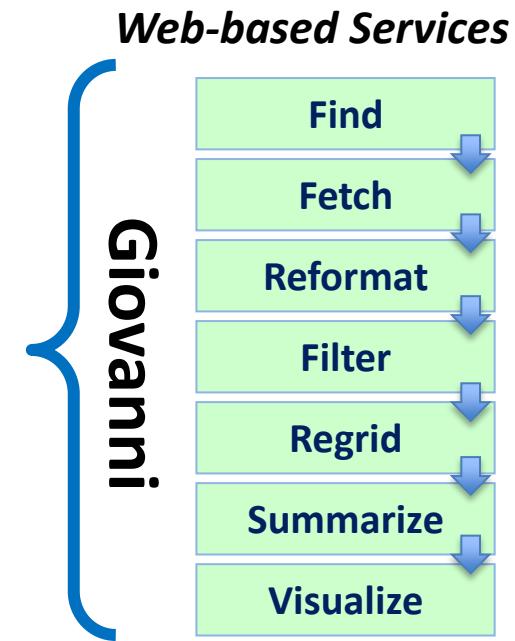




Giovanni provides (relatively) rapid exploration of datasets



Giovanni provides
Server-Side, Quick-Start Exploratory Data Analysis:
no coding necessary
no downloads necessary





What's New?

- Giovanni-4, relative to Giovanni-3
 - Omnibus Giovanni Portal
 - Federated Giovanni
 - Variable selection interface
 - Sharable/reproducible URLs
- New in Giovanni-4
 - More comparison functions
 - Vector Plots
 - Seasonal Analysis
 - Shapefile-based Area Averages



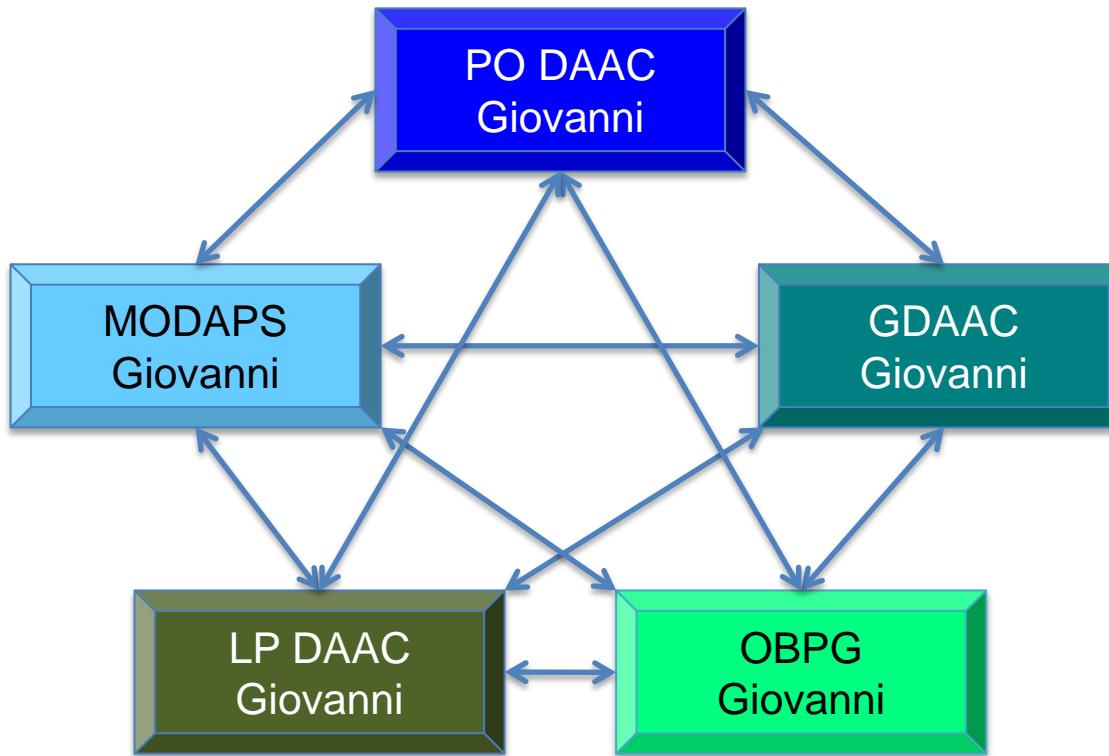
Omnibus Portal

- All variables in one portal
 - Compare across instruments and disciplines
 - Caveat: Multi-temporal comparisons not yet supported
- However: Requires more navigational aids



Federated Giovanni will further increase the availability of data in Giovanni

- Ongoing now: Funded by NASA-ACCESS: 2014-2016



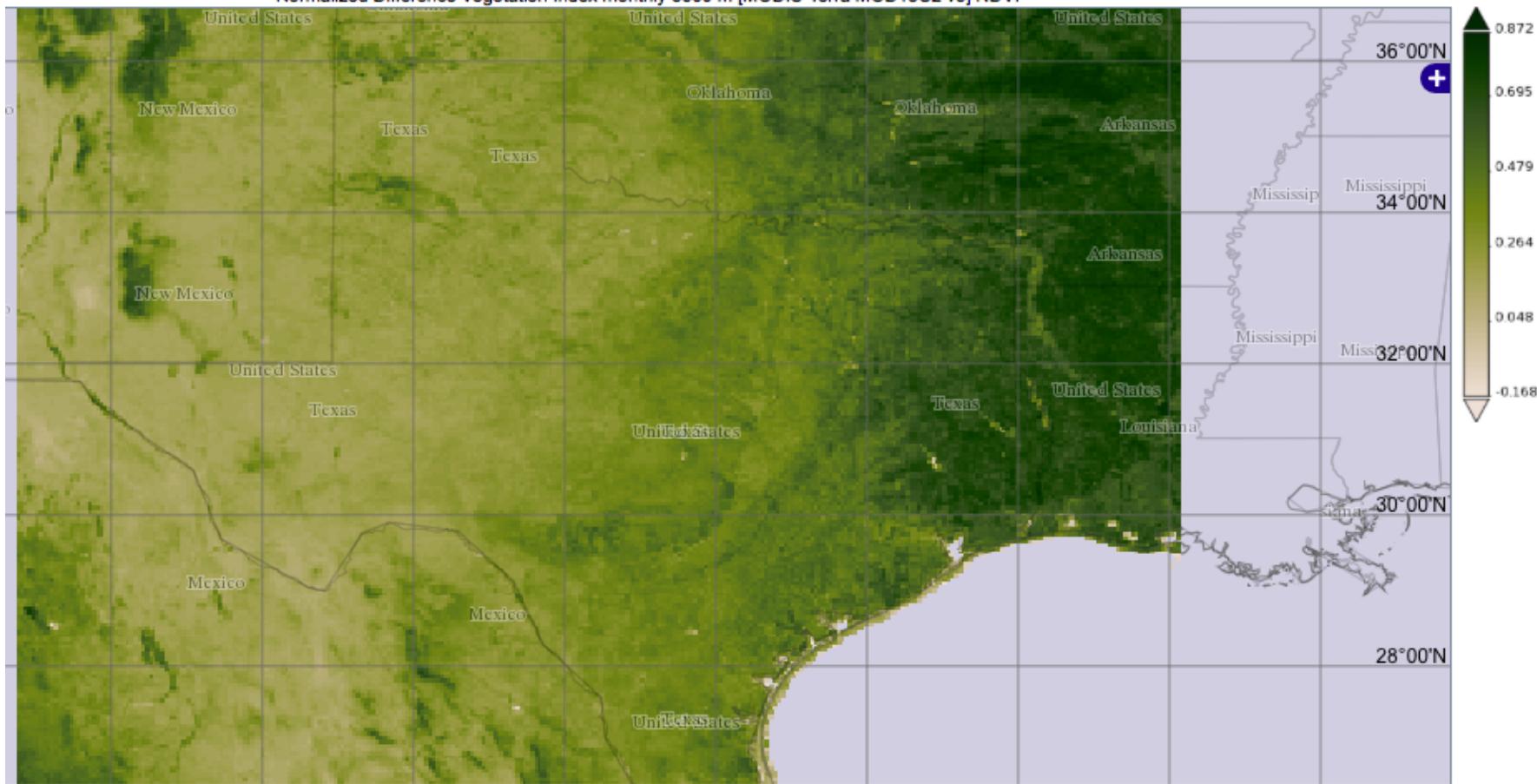
- Eventual release of source and Virtual Machine to the community



MODIS NDVI from LP DAAC

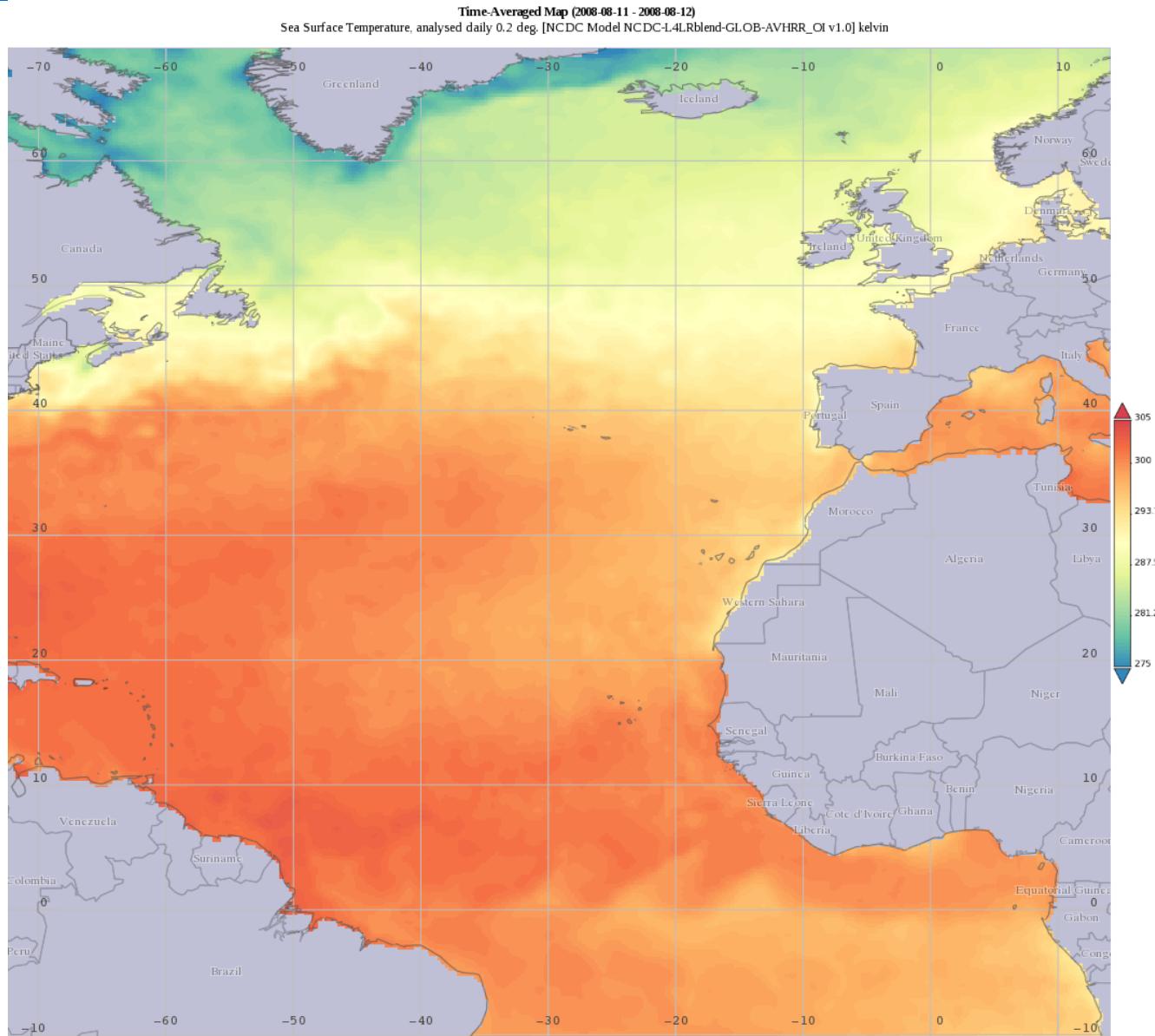
Time-Averaged Map (2011-Jun - 2011-Sep)

Normalized Difference Vegetation Index monthly 5600 m [MODIS-Terra MOD13C2 v5] NDVI





SST from PO.DAAC





Giovanni-4 User Interface

GiovanniThe Bridge Between Data and Science v 4.10 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)NLDAS Soil Moisture Content variables temporarily unavailable... [1 of 2 messages] [Read More](#)**Select Plot**

Choose a plot type.

 Maps: Time-Averaged Comparisons: Select... Time Series: Select... Vertical: Select... Miscellaneous: Select...**Select Date Range (UTC)**

YYYY-MM-DD

2011 - 01 - 01 00 hrs to 2011 - 01 - 02 23 hrs

Valid Range: 2000-03-01 to 2014-10-13

Select Region (Bounding Box)

Format: West, South, East, North

-127.2656, 24.6094, -67.5, 50.625

**Select Variables****Disciplines** Aerosols (8)**Measurements** Angstrom Exponent (4) Statistics (2) Total Aerosol Optical Depth (2)**Platform / Instrument****Wavelengths****Spatial Resolutions****Temporal Resolutions****Vertical**

Number of matching Variables: 8 of 219

Keyword: Dark Targ

| | Dark Target | Temp. Res. | Spat. Res. | Begin Date | End Date | Vert. Slice |
|-------------------------------------|--|-------------|------------|------------|------------|-------------|
| <input type="checkbox"/> | Pixel Count of Aerosol Optical Depth 550 nm (Dark Target) (MYD08_D3 v051) | MODIS-Aqua | Daily | 1 ° | 2002-07-04 | 2014-10-24 |
| <input type="checkbox"/> | Aerosol Optical Depth 550 nm (Dark Target) (MYD08_D3 v051) | MODIS-Aqua | Daily | 1 ° | 2002-07-04 | 2014-10-24 |
| <input type="checkbox"/> | Aerosol Angstrom Exponent 470/660 nm (Dark Target, Land-only) (MYD08_D3 v051) | MODIS-Aqua | Daily | 1 ° | 2002-07-04 | 2014-10-24 |
| <input type="checkbox"/> | Aerosol Angstrom Exponent 550/865 nm (Dark Target, Ocean-only) (MYD08_D3 v051) | MODIS-Aqua | Daily | 1 ° | 2002-07-04 | 2014-10-24 |
| <input type="checkbox"/> | Pixel Count of Aerosol Optical Depth 550 nm (Dark Target) (MOD08_D3 v051) | MODIS-Terra | Daily | 1 ° | 2000-03-01 | 2014-10-13 |
| <input type="checkbox"/> | Aerosol Angstrom Exponent 470/660 nm (Dark Target, Land-only) (MOD08_D3 v051) | MODIS-Terra | Daily | 1 ° | 2000-03-01 | 2014-10-13 |
| <input checked="" type="checkbox"/> | Aerosol Angstrom Exponent 550/865 nm (Dark Target, Ocean-only) (MOD08_D3 v051) | MODIS-Terra | Daily | 1 ° | 2000-03-01 | 2014-10-13 |

Faceted Browse**Search with Autosuggest****Sortable columns**

Total Variable(s) included in Plot: 1



NASA Earth Data Data Discovery Data Centers Community Science Disciplines Search EOSDIS

Giovanni The Bridge Between Data and Science v 4.10 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

Select Plot
Choose a plot type.

Maps: Time-Averaged Comparisons: Select... Time Series: Select... Vertical: Select... Miscellaneous: Select...

Select Date Range (UTC)
YYYY-MM-DD to 23 hrs
Valid Range: 1979-01-01 to 2014-11-04

Select Region (Bounding Box)
Format: West, South, East, North -180, -90, 180, 90

Please specify a start date.

Select Variables

Disciplines

- Aerosols (118)
- Atmospheric Chemistry (12)
- Atmospheric Dynamics (62)
- Hydrology (16)
- Water and Energy Cycle (26)

Measurements

Platform / Instrument

Wavelengths

Depths

Spatial Resolutions

Temporal Resolutions

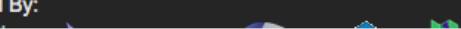
Number of matching Variables: 0 of 219

Keyword: Search Clear

Total Variable(s) Included in Plot: 0

Help Reset Feedback Plot Data

Responsible NASA Official: Steven.J.Kempler@nasa.gov [Web Counter](#) [Mailbox](#) [Feedback](#) [Help](#) [Reset](#) [Feedback](#) [Plot Data](#)

Powered By: 

Contact Us



Keyword search on precipitation

NASA Earth Data Data Discovery Data Centers Community Science Disciplines Search EOSDIS

Giovanni The Bridge Between Data and Science v 4.10 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

Select Plot

Choose a plot type.

Maps: Time-Averaged Comparisons: [Select...](#) Time Series: [Select...](#) Vertical: [Select...](#) Miscellaneous: [Select...](#)

Select Date Range (UTC)

YYYY-MM-DD

Valid Range: 1979-01-01 to 2014-11-04

Please specify a start date.

Select Variables

Disciplines

Hydrology (6) Water and Energy Cycle (1)

Measurements

Platform / Instrument

Spatial Resolutions

Temporal Resolutions

Portal

Select Region (Bounding Box)

Format: West, South, East, North

-180, -90, 180, 90 

Number of matching Variables: 6 of 219

Total Variable(s) included in Plot: 0

Keyword : [Search](#) [Clear](#)

| | Variable Name | Source | Temp. Res. | Spat. Res. | Begin Date | End Date | Vert. Slice |
|--------------------------|---|-------------|------------|------------|------------|------------|-------------|
| <input type="checkbox"/> | Precipitation Total (NLDAS_FORA0125_M v002) | NLDAS Model | Monthly | 0.125 ° | 1979-01-01 | 2014-09-30 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B43 v7) | TRMM | Monthly | 0.25 ° | 1998-01-01 | 2014-08-31 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B43 v6) | TRMM | Monthly | 0.25 ° | 1998-01-01 | 2011-06-30 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily v7) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2014-08-31 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily v6) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2011-06-30 | - |
| <input type="checkbox"/> | Precipitation Total (NLDAS_FORA0125_H v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-01 | 2014-10-31 | - |

[Help](#) [Reset](#) [Feedback](#) [Plot Data](#)

Responsible NASA Official: Steven.J.Kempler@nasa.gov Powered By: [Web Content Management System](#) [Contact Us](#)



Reset with button or by clearing search

NASA Earth Data Data Discovery Data Centers Community Science Disciplines Search EOSDIS

Giovanni The Bridge Between Data and Science v 4.10 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

Select Plot
Choose a plot type.

Maps: Time-Averaged Comparisons: Select... Time Series: Select... Vertical: Select... Miscellaneous: Select...

Select Date Range (UTC)
YYYY-MM-DD to 23 hrs

Valid Range: 1979-01-01 to 2014-11-04

Please specify a start date.

Select Variables

Disciplines

- Aerosols (118)
- Atmospheric Chemistry (12)
- Atmospheric Dynamics (62)
- Hydrology (16)
- Water and Energy Cycle (26)

Measurements

- Aerosol Index (1)
- Air Pressure (4)
- Air Temperature (14)
- Albedo (5)
- Altitude (4)
- Angstrom Exponent (16)
- Atmospheric Moisture (20)
- CH4 (4)
- CO (4)
- Cloud Fraction (4)

Number of matching Variables: 0 of 219

Keyword:

Total Variable(s) included in Plot: 0

Responsible NASA Official: Steven.J.Kempler@nasa.gov
Web Content Manager: Giovanni.Gesdisc@nasa.gov

Powered By:

Contact Us



Selecting a Discipline “Facet”

NASA Earth Data Data Discovery Data Centers Community Science Disciplines Search EOSDIS

Giovanni The Bridge Between Data and Science v 4.10 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

Select Plot
Choose a plot type.

Maps: Time-Averaged Comparisons: Select... Time Series: Select... Vertical: Select... Miscellaneous: Select...

Select Date Range (UTC)
YYYY-MM-DD
- to 00 hrs to 23 hrs
Valid Range: 1979-01-01 to 2014-11-04

Please specify a start date.

Select Variables

Disciplines

- Aerosols (118)
- Atmospheric Chemistry (12)
- Atmospheric Dynamics (62)
- Hydrology (16)
- Water and Energy Cycle (26)

Measurements

Platform / Instrument

Depths

Spatial Resolutions

Temporal Resolutions

Portal

Select Region (Bounding Box)
Format: West, South, East, North
-180, -90, 180, 90

Number of matching Variables: 16 of 219

Total Variable(s) Included in Plot: 0

Keyword :

| | Variable Name | Source | Temp. Res. | Spat. Res. | Begin Date | End Date | Vert. Slice |
|--|--|-------------|------------|------------|------------|------------|-------------|
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily_v6) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2011-06-30 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily_v7) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2014-08-31 | - |
| <input type="checkbox"/> | Precipitation Total (NLDAS_FORA0125_H_v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-01 | 2014-10-31 | - |
| <input type="checkbox"/> | Evapotranspiration Total (NLDAS_NOAH0125_H_v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-02 | 2014-10-31 | - |
| <input type="checkbox"/> | Soil Moisture Content Layer 1 (0-10 cm) (NLDAS_NOAH0125_H_v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-02 | 2014-10-31 | - |
| <input type="checkbox"/> | Soil Moisture Content Top 1 Meter (0-100 cm) (NLDAS_NOAH0125_H_v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-02 | 2014-10-31 | - |
| <small>Soil Moisture Content Total Column (0-200 cm) (NLDAS_NOAH0125_H_v002)</small> | | | | | | | |

Responsible NASA Official: Steven.J.Kempler@nasa.gov Powered By: [NASA Earth Data](#) [Data Discovery](#) [Data Centers](#) [Community](#) [Science Disciplines](#) [Search EOSDIS](#) [Contact Us](#)



Selecting a Discipline “Facet”

NASA Earth Data Data Discovery Data Centers Community Science Disciplines Search EOSDIS

Giovanni The Bridge Between Data and Science v 4.10 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

Select Plot
Choose a plot type.

Maps: Time-Averaged Comparisons: Select... Time Series: Select... Vertical: Select... Miscellaneous: Select...

Select Date Range (UTC)
YYYY-MM-DD
00 hrs to 23 hrs
Valid Range: 1979-01-01 to 2014-11-04

Please specify a start date.

Select Variables

Disciplines

- Aerosols (118)
- Atmospheric Chemistry (12)
- Atmospheric Dynamics (62)
- Hydrology (16) **16**
- Water and Energy Cycle (26)

Measurements

Platform / Instrument

Depths

Spatial Resolutions

Temporal Resolutions

Portal

Select Region (Bounding Box)
Format: West, South, East, North
-180, -90, 180, 90 

Number of matching variables: 16 of 219 Total Variable(s) included in Plot: 0

| | Variable Name | Source | Temp. Res. | Spat. Res. | Begin Date | End Date | Vert. Slice |
|--------------------------|--|-------------|------------|------------|------------|------------|-------------|
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily_v6) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2011-06-30 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily_v7) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2014-08-31 | - |
| <input type="checkbox"/> | Precipitation Total (NLDAS_FORA0125_H_v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-01 | 2014-10-31 | - |
| <input type="checkbox"/> | Evapotranspiration Total (NLDAS_NOAH0125_H_v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-02 | 2014-10-31 | - |
| <input type="checkbox"/> | Soil Moisture Content Layer 1 (0-10 cm) (NLDAS_NOAH0125_H_v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-02 | 2014-10-31 | - |
| <input type="checkbox"/> | Soil Moisture Content Top 1 Meter (0-100 cm) (NLDAS_NOAH0125_H_v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-02 | 2014-10-31 | - |

[Help](#) [Reset](#) [Feedback](#) [Plot Data](#)

Responsible NASA Official: Steven.J.Kempler@nasa.gov
Web Content Manager: steven.j.kempler@nasa.gov

Powered By: 

Contact Us



Narrow by selecting more facets

Narrow by selecting more facets

NASA Earth Data Data Discovery Data Centers Community Science Disciplines Search EOSDIS

Giovanni The Bridge Between Data and Science v 4.10 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

Select Plot
Choose a plot type.

Maps: Time-Averaged Comparisons: Select... Time Series: Select... Vertical: Select... Miscellaneous: Select...

Select Date Range (UTC)
YYYY-MM-DD to 23 hrs Valid Range: 1979-01-01 to 2014-11-04

Select Region (Bounding Box)
Format: West, South, East, North -180, -90, 180, 90

Please specify a start date.

Select Variables

Disciplines

Hydrology (6) Water and Energy Cycle (1)

Measurements

Air Temperature (2) Evapotranspiration (1) Precipitation (6) Soil moisture (6) Surface Runoff (1)

Platform / Instrument

Spatial Resolutions

Temporal Resolutions

Portal

Number of matching Variables: 6 of 219

Keyword : Search Clear

| | Variable Name | Source | Temp. Res. | Spat. Res. | Begin Date | End Date | Vert. Slice |
|--------------------------|---|-------------|------------|------------|------------|------------|-------------|
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily_v6) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2011-06-30 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily_v7) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2014-08-31 | - |
| <input type="checkbox"/> | Precipitation Total (NLDAS_FORA0125_H_v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-01 | 2014-10-31 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B43_v7) | TRMM | Monthly | 0.25 ° | 1998-01-01 | 2014-08-31 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B43_v6) | TRMM | Monthly | 0.25 ° | 1998-01-01 | 2011-06-30 | - |
| <input type="checkbox"/> | Precipitation Total (NLDAS_FORA0125_M_v002) | NLDAS Model | Monthly | 0.125 ° | 1979-01-01 | 2014-09-30 | - |

Total Variable(s) Included in Plot: 0

Help Reset Feedback **Plot Data**

Responsible NASA Official: Steven.J.Kempler@nasa.gov
Web Counter: [M. Hines](#) [Steven.J.Kempler@nasa.gov](#)

Powered By:

Contact Us



Selecting variables leads to hints on date range

NASA Earth Data Data Discovery Data Centers Community Science Disciplines Search EOSDIS

Giovanni The Bridge Between Data and Science v 4.10 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

Select Plot
Choose a plot type.

Maps: Time-Averaged Comparisons: Select... Time Series: Select... Vertical: Select... Miscellaneous: Select...

Select Date Range (UTC)
YYYY-MM-DD to 23 hrs
Valid Range: 1997-12-31 to 2014-08-31

Select Region (Bounding Box)
Format: West, South, East, North -180, -90, 180, 90

Please specify a start date. Maximum range is 61368 days

Select Variables

Disciplines

Hydrology (6) Water and Energy Cycle (1)

Measurements

Air Temperature (2) Evapotranspiration (1) Precipitation (6) Soil Moisture (6) Surface Runoff (1)

Platform / Instrument

Spatial Resolutions

Temporal Resolutions

Portal

Number of matching Variables: 6 of 219 Total Variable(s) included in Plot: 1

Keyword : Search Clear

| | Variable Name | Source | Temp. Res. | Spat. Res. | Begin Date | End Date | Vert. Slice |
|-------------------------------------|---|-------------|------------|------------|------------|------------|-------------|
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily_v6) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2011-06-30 | - |
| <input checked="" type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily_v7) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2014-08-31 | - |
| <input type="checkbox"/> | Precipitation Total (NLDAS_FORA0125_H_v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-01 | 2014-10-31 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B43_v7) | TRMM | Monthly | 0.25 ° | 1998-01-01 | 2014-08-31 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B43_v6) | TRMM | Monthly | 0.25 ° | 1998-01-01 | 2011-06-30 | - |
| <input type="checkbox"/> | Precipitation Total (NLDAS_FORA0125_M_v002) | NLDAS Model | Monthly | 0.125 ° | 1979-01-01 | 2014-09-30 | - |

Help Reset Feedback Plot Data

Responsible NASA Official: Steven.J.Kempler@nasa.gov Powered By: [NASA Earth Data](#) [Data Discovery](#) [Data Centers](#) [Community](#) [Science Disciplines](#) [Search EOSDIS](#) [Contact Us](#)



Selecting variables leads to hints on date range

giovanni.gsfc.nasa.gov

NASA Earth Data Data Discovery Data Centers Community Science Disciplines Search EOSDIS

Giovanni The Bridge Between Data and Science v 4.10 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

Select Plot
Choose a plot type.

Maps: Time-Averaged Comparisons: Select... Time Series: Select... Vertical: Select... Miscellaneous: Select...

Select Date Range (UTC)
YYYY-MM-DD 00 hrs to 23 hrs 180, -90, 180, 90

Select Region (Bounding Box)
Format: West, South, East, North

Valid Range: 1997-12-31 to 2014-08-31

Please specify a start date. Maximum range is 61368 days

Select Variables

Disciplines
 Hydrology (6) Water and Energy Cycle (1)

Measurements
 Air Temperature (2) Evapotranspiration (1) Precipitation (6) Soil Moisture (6) Surface Runoff (1)

Platform / Instrument

Spatial Resolutions

Temporal Resolutions

Portal

Number of matching Variables: 6 of 219

Keyword : Search Clear

| | Variable Name | Source | Temp. Res. | Spat. Res. | Begin Date | End Date | Vert. Slice |
|-------------------------------------|---|-------------|------------|------------|------------|------------|-------------|
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily_v6) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2011-06-30 | - |
| <input checked="" type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily_v7) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2014-08-31 | - |
| <input type="checkbox"/> | Precipitation Total (NLDAS_FORA0125_H_v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-01 | 2014-10-31 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B43_v7) | TRMM | Monthly | 0.25 ° | 1998-01-01 | 2014-08-31 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B43_v6) | TRMM | Monthly | 0.25 ° | 1998-01-01 | 2011-06-30 | - |
| <input type="checkbox"/> | Precipitation Total (NLDAS_FORA0125_M_v002) | NLDAS Model | Monthly | 0.125 ° | 1979-01-01 | 2014-09-30 | - |

Total Variable(s) included in Plot: 1

Help Reset Feedback Plot Data

Responsible NASA Official: Steven.J.Kempler@nasa.gov Powered By: [Giovanni](#) Contact Us

Web Counter: [M. Hines](#) Michael.Hines@nasa.gov



You can also sort on columns

NASA Earth Data Data Discovery Data Centers Community Science Disciplines Search EOSDIS

Giovanni The Bridge Between Data and Science v 4.10 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

Select Plot
Choose a plot type.

Maps: Time-Averaged Comparisons: Select... Time Series: Select... Vertical: Select... Miscellaneous: Select...

Select Date Range (UTC)
YYYY-MM-DD 00 hrs to 23 hrs
Valid Range: 1997-12-31 to 2014-08-31

Please specify a start date. Maximum range is 61368 days

Select Variables

Disciplines
 Hydrology (6) Water and Energy Cycle (1)

Measurements
 Air Temperature (2) Evapotranspiration (1) Precipitation (6) Soil Moisture (6) Surface Runoff (1)

► Platform / Instrument
► Spatial Resolutions
► Temporal Resolutions
► Portal

Select Region (Bounding Box)
Format: West, South, East, North
-180, -90, 180, 90

Number of matching Variables: 6 of 219

Total Variable(s) included in Plot: 1

| | Variable Name | Source | Temp. Res. | Spat. Res. | Begin Date | End Date | Vert. Slice |
|-------------------------------------|---|-------------|------------|------------|------------|------------|-------------|
| <input type="checkbox"/> | Precipitation Total (NLDAS_FORA0125_H v002) | NLDAS Model | Hourly | 0.125 ° | 1979-01-01 | 2014-10-31 | - |
| <input type="checkbox"/> | Precipitation Total (NLDAS_FORA0125_M v002) | NLDAS Model | Monthly | 0.125 ° | 1979-01-01 | 2014-09-30 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B43 v7) | TRMM | Monthly | 0.25 ° | 1998-01-01 | 2014-08-31 | - |
| <input checked="" type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily v7) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2014-08-31 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B43 v6) | TRMM | Monthly | 0.25 ° | 1998-01-01 | 2011-06-30 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily v6) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2011-06-30 | - |

Help Reset Feedback **Plot Data**

Responsible NASA Official: Steven.J.Kempler@nasa.gov Powered By: [Giovanni](#) [EOSDIS](#) [NASA](#) [Goddard](#) [GES DISC](#)

Contact Us



Spatial and temporal resolution facets are also available

NASA Earth Data Data Discovery Data Centers Community Science Disciplines Search EOSDIS

Giovanni The Bridge Between Data and Science v 4.10 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

Select Plot
Choose a plot type.

Maps: Time-Averaged Comparisons: Select... Time Series: Select... Vertical: Select... Miscellaneous: Select...

Select Date Range (UTC)
YYYY-MM-DD
- 00 hrs to - 23 hrs
Valid Range: 1997-12-31 to 2014-08-31

Please specify a start date. Maximum range is 61368 days

Select Variables

Disciplines
 Hydrology (2)

Measurements
 Precipitation (2)

Platform / Instrument

Spatial Resolutions

Temporal Resolutions
 daily (2)
 hourly (1)
 monthly (3)

Portal

Select Region (Bounding Box)
Format: West, South, East, North
-180, -90, 180, 90

Number of matching Variables: 2 of 219 Total Variable(s) included in Plot: 1

Keyword:

| | Variable Name | Source | Temp. Res. | Spat. Res. | Begin Date | End Date | Vert. Slice |
|-------------------------------------|---|--------|------------|------------|------------|------------|-------------|
| <input checked="" type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily_v7) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2014-08-31 | - |
| <input type="checkbox"/> | Precipitation Rate (TRMM_3B42_daily_v6) | TRMM | Daily | 0.25 ° | 1997-12-31 | 2011-06-30 | - |

Responsible NASA Official: Steven.J.Kempler@nasa.gov Powered By:

Web Curator: M.Haegele@gsfc.nasa.gov Contact Us



Giovanni-4 selections are encoded in the URL

Making them Sharable and Reproducible

<http://giovanni.gsfc.nasa.gov/giovanni/#>

service=INTERACTIVE_MAP&

starttime=2001-01-01T00:00:00Z&

endtime=2001-01-31T23:59:59Z&

bbox=-124.4531,24.2578,-68.2031,52.3828&

data=MOD08_D3_051_Optical_Depth_Land_And_Ocean_Mean&

variableFacets=dataFieldDiscipline%3AAerosols%3B

Service

Time Range

Bounding Box

Data Variable



Giovanni-4 URLs are Sharable and Reproducible

Service

Select Plot
Choose a plot type.

Maps: Time-Averaged Comparisons: Select... Time Series: Select... Vertical: Select... Miscellaneous: Select...

Select Date Range (UTC)
YYYY-MM-DD
2001 - 01 - 01 00 hrs to 2001 - 01 - 31 23 hrs
Valid Range: 2000-03-01 to 2014-10-13

Select Region (Bounding Box)
Format: West, South, East, North
-124.4531, 24.2578, -68.2031, 52.3828

Time Range

Bounding Box

Select Variables

▼ Disciplines

- Aerosols (118)
- Atmospheric Chemistry (12)
- Atmospheric Dynamics (62)
- Hydrology (16)
- Water and Energy Cycle (26)

► Measurements

► Platform / Instrument

► Wavelengths

► Spatial Resolutions

► Temporal Resolutions

► Portal

Number of matching Variables: 118 of 219

Total Variable(s) included in Plot: 1

| | Variable Name | Source | Temp. Res. | Spat. Res. | Begin Date | End Date |
|-------------------------------------|--|-------------|------------|------------|------------|------------|
| <input checked="" type="checkbox"/> | Aerosol Optical Depth 550 nm (Dark Target) (MOD08_D3 v051) | MODIS-Terra | Daily | 1 ° | 2000-03-01 | 2014-10-13 |
| <input type="checkbox"/> | Aerosol Angstrom Exponent 550/865 nm (Dark Target, Ocean-only) (MOD08_D3 v051) | MODIS-Terra | Daily | 1 ° | 2000-03-01 | 2014-10-13 |
| <input type="checkbox"/> | Aerosol Angstrom Exponent 470/660 nm (Dark Target, Land-only) (MOD08_D3 v051) | MODIS-Terra | Daily | 1 ° | 2000-03-01 | 2014-10-13 |
| <input type="checkbox"/> | Pixel Count of Aerosol Optical Depth 550 nm (Dark Target) (MOD08_D3 v051) | MODIS-Terra | Daily | 1 ° | 2000-03-01 | 2014-10-13 |
| <input type="checkbox"/> | Aerosol Optical Depth 550 nm (Deep Blue, Land-only) (MOD08_D3 v051) | MODIS-Terra | Daily | 1 ° | 2000-03-01 | 2007-12-31 |

Help Reset Feedback Plot Data

Data Variable

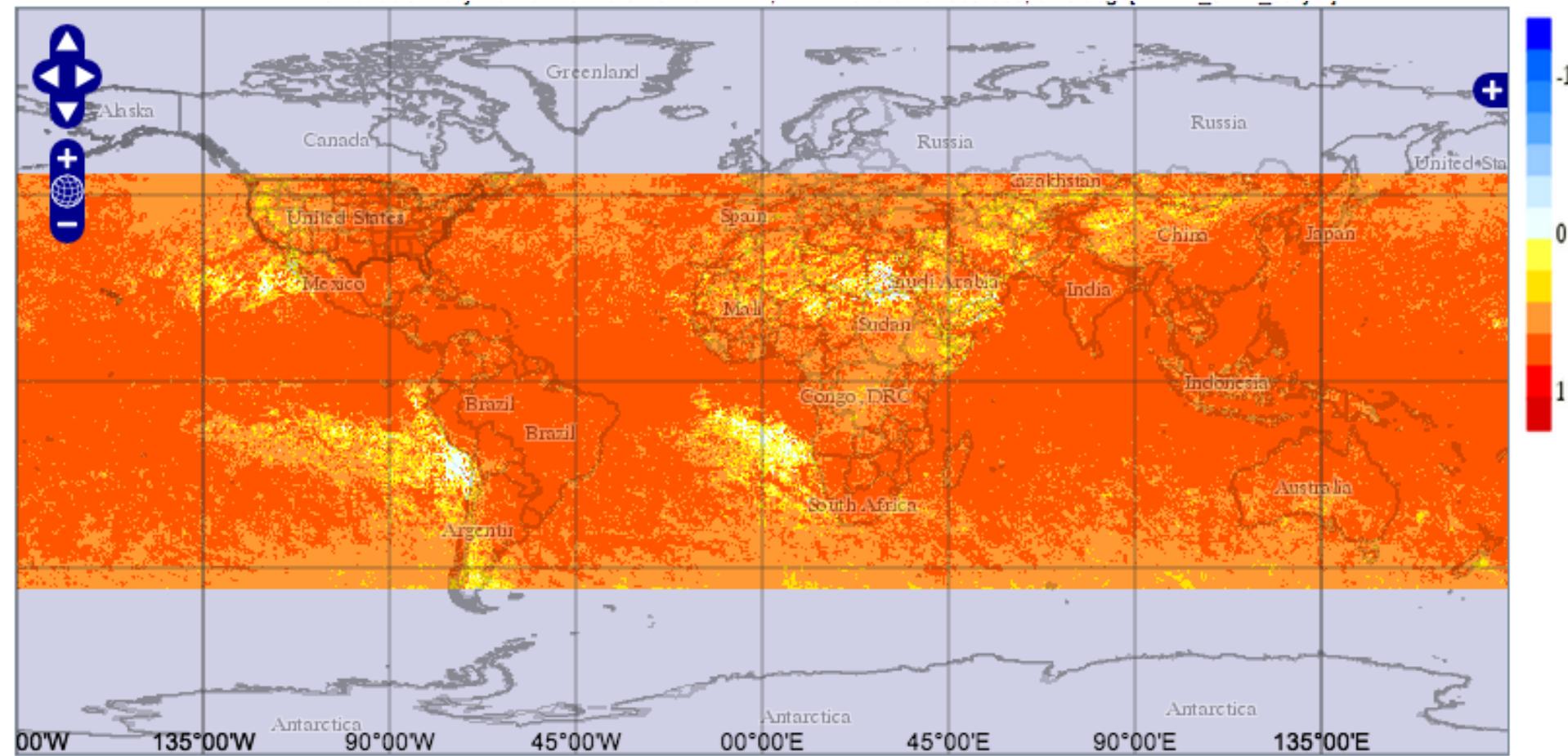


- Correlation Map
- Difference of Time-Averaged Maps
- Time Averaged Scatterplot
- Area Averaged Scatterplot
- Time Series of Differences of Area Averages



Correlation Map: TRMM Rainfall Versions 6 vs. 7

2010-2011



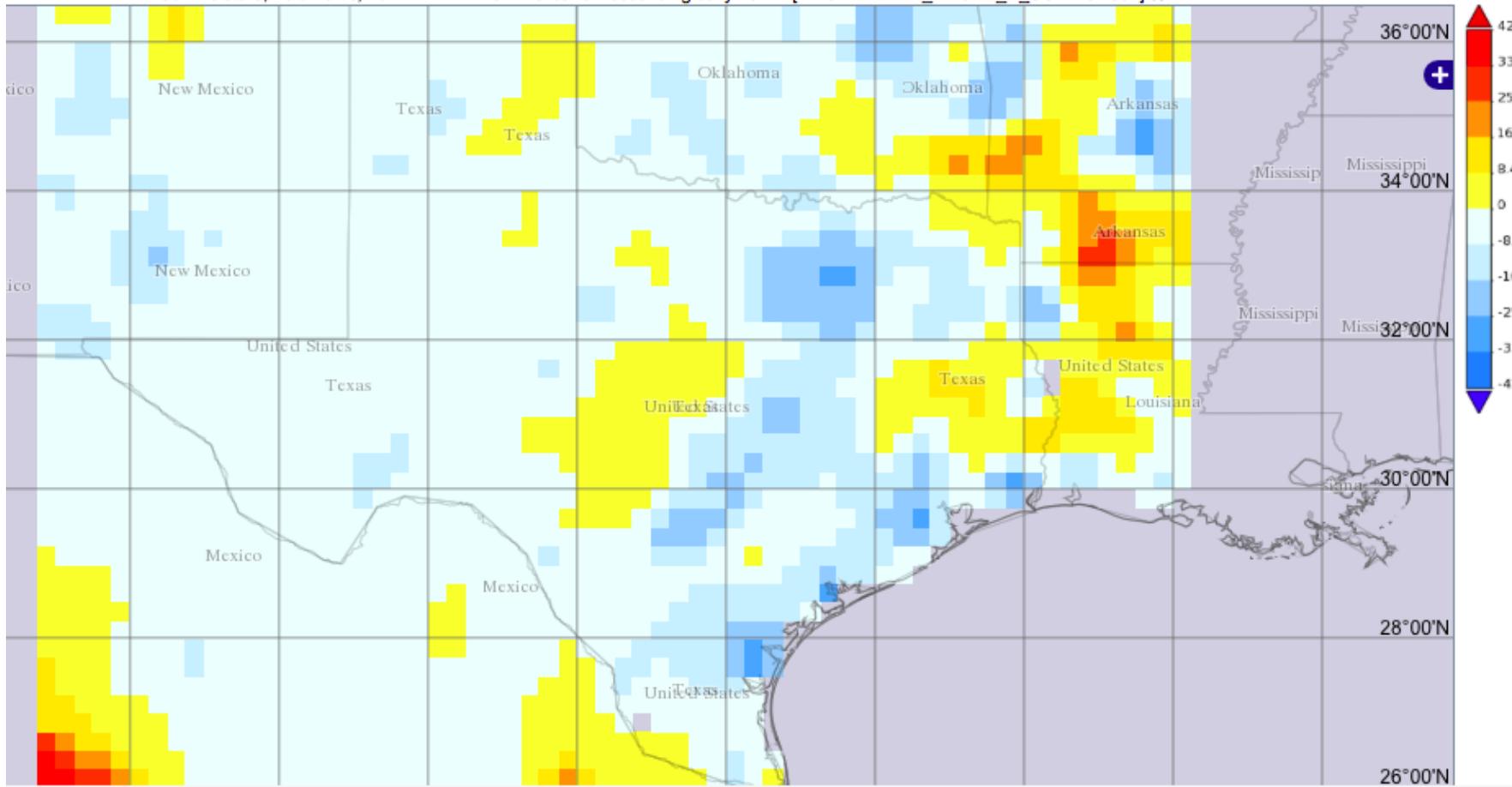


Difference of Time-Averaged Maps

Map, Difference of Time Averaged over 2011-06-01 - 2011-09-30, Region 107.2266W, 26.042N, 91.8457W, 36.6768N

Soil Moisture, Volumetric, from LPRM AMSRE X-band Descending daily 25 km [AMSR-E LPRM_AMSRE_D_SOILM3 v002] % minus

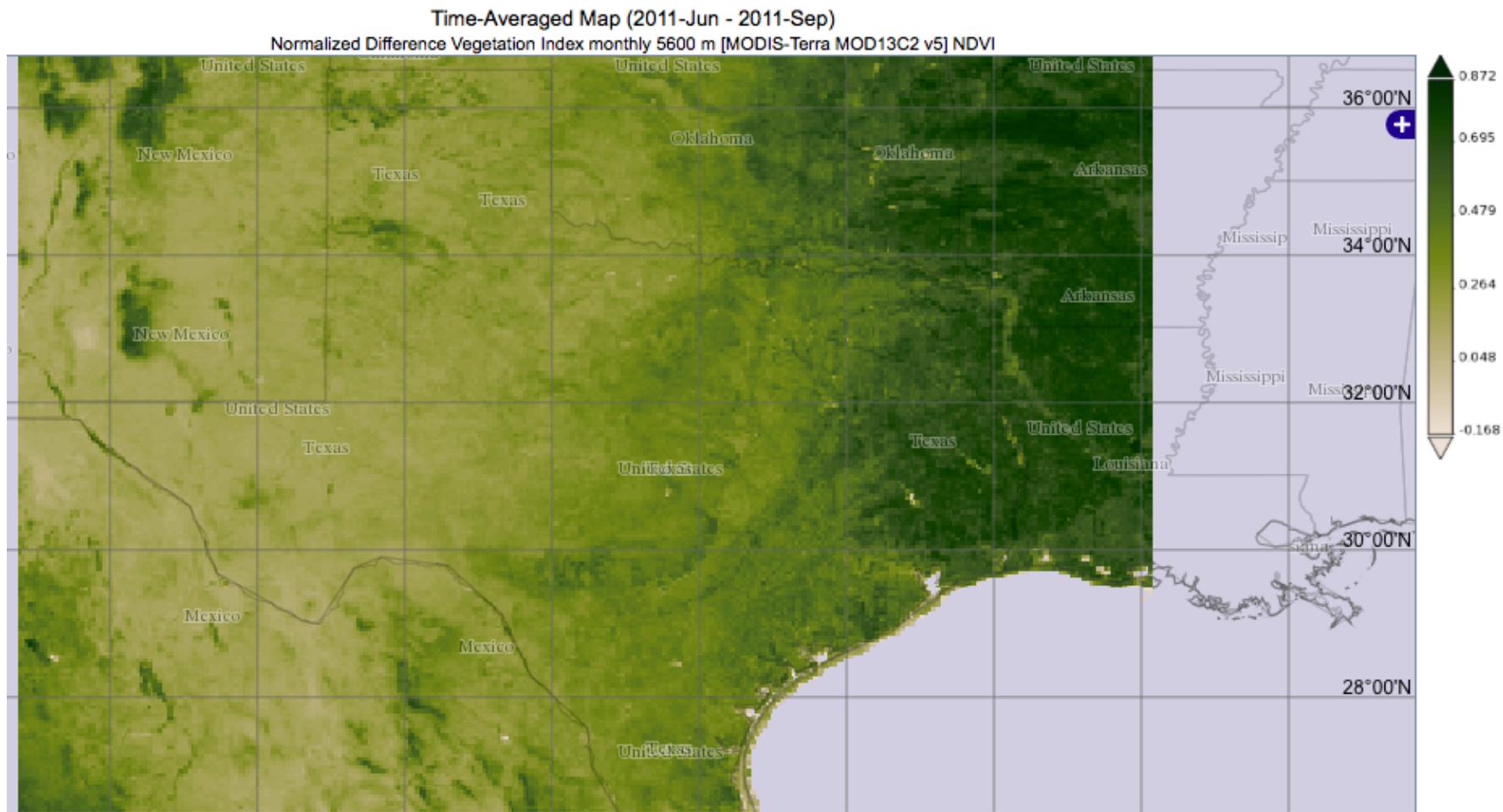
Soil Moisture, Volumetric, from LPRM AMSRE C-band Descending daily 25 km [AMSR-E LPRM_AMSRE_D_SOILM3 v002] %



- LPRM from X-band is more affected by vegetation than by C. This difference map shows that C and X don't differ that much when the surface is bare to sparsely vegetated, but do differ when the surface is more densely vegetated and soil moisture retrieval becomes problematic. (Courtesy Bill Teng)



MODIS NDVI from LP DAAC





New Services

- Vector Plots
- Seasonal Analysis
 - User-defined Climatology
 - Interannual Time Series
- Shapefile-based Area Average Time Series

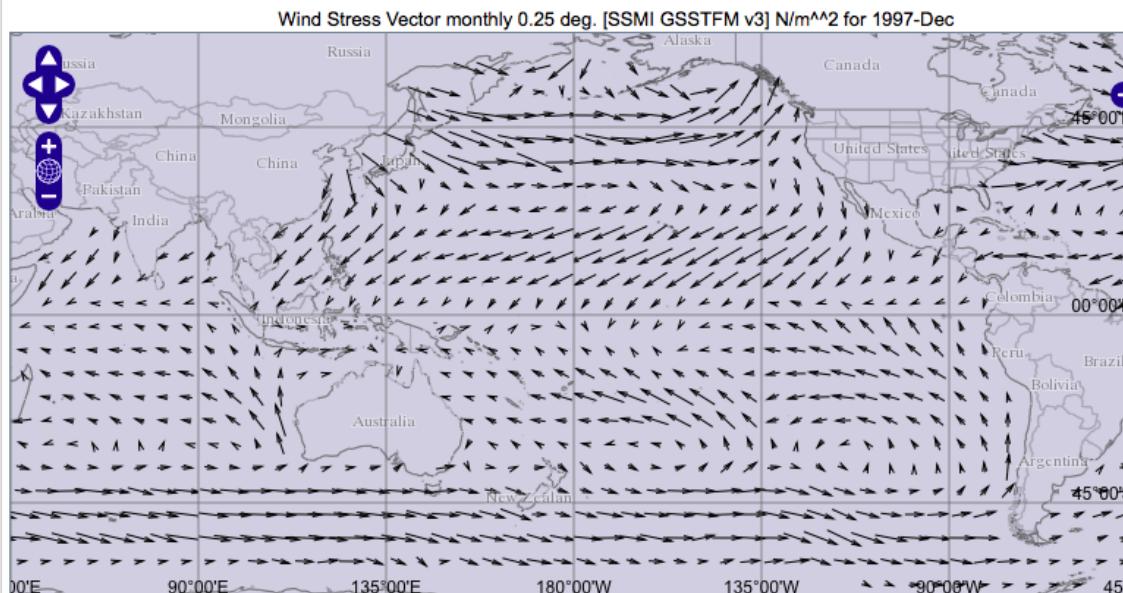


Vector Plots

- Available for some wind-related variables
 - More coming soon...
- Time Averaged Map service only
- Computes averages of U and V, then vector magnitude + direction

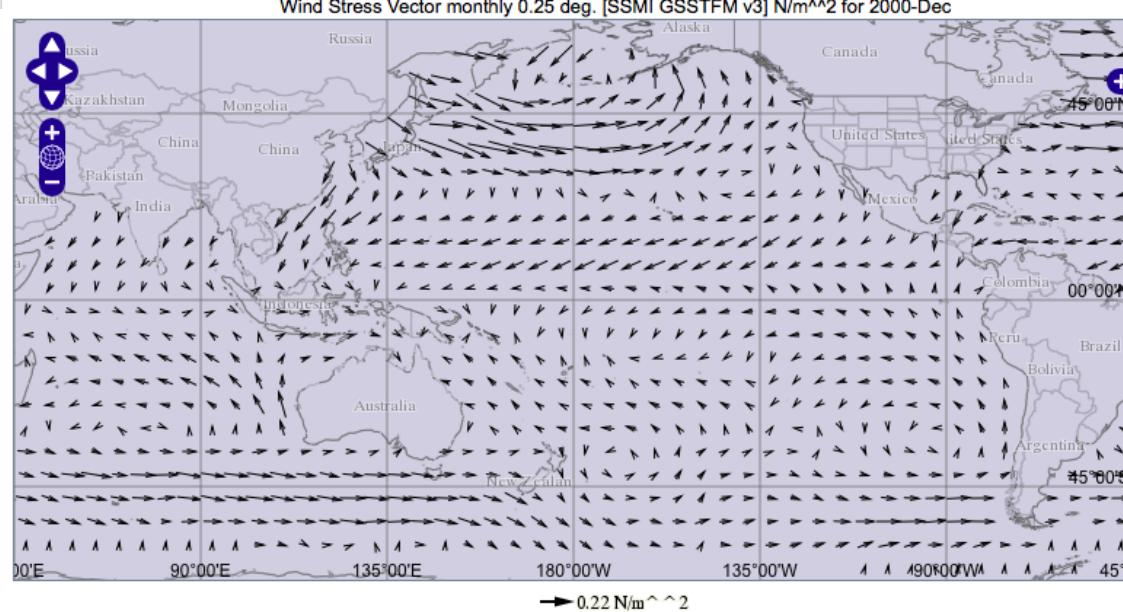


Vector Plots (Time-Averaged Map)



Wind Stress

Dec 1997 (El Niño)



Dec 2000 (La Niña)

Courtesy Chung-Lin Shie



User-Defined Climatology

Available for Monthly data

Aggregate by Month or Meteorological Season (DJF, MAM, JJA, SON)

Select Plot

Choose a plot type.

Maps: User-Defined Climatology

Comparisons: Select...

Select Seasonal Dates

Month or Season and YYYY range.

March,September



2001



to

2013



Select months or seasons X

4-10-29

Months Seasons

- January July
- February August
- March September
- April October
- May November
- June December

► Wavelengths

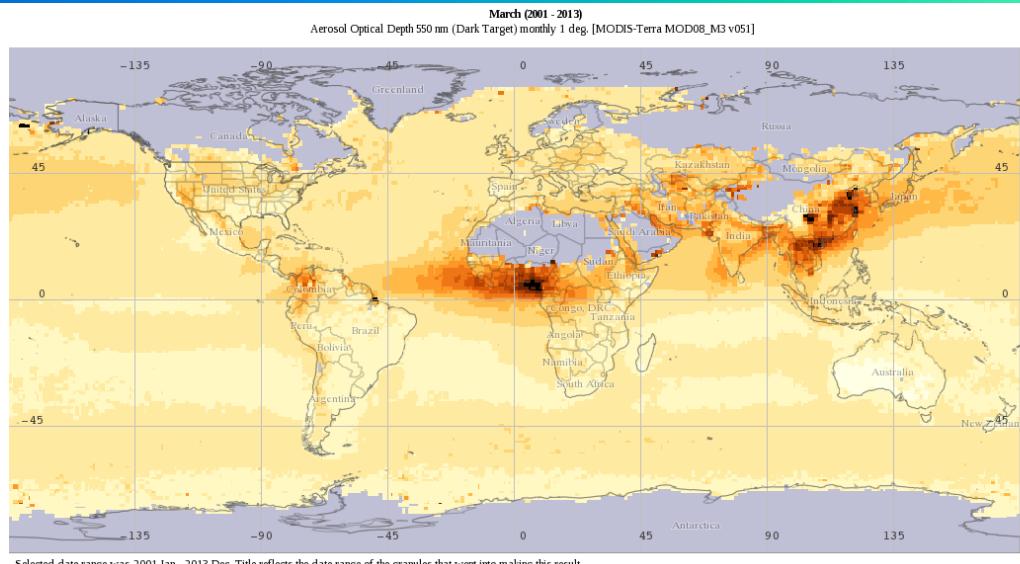
Number of matching Variables: 2

Keyword :

| | | Variables |
|-------------------------------------|---|---|
| <input checked="" type="checkbox"/> | Aerosol Optical Depth 550 nm (Target) (MOD08_M3 v003) | Aerosol Optical Depth 550 nm (Target) (MOD08_M3 v003) |
| | Aerosol Optical Depth 550 nm (Target) (MOD08_M3 v003) | Aerosol Optical Depth 550 nm (Target) (MOD08_M3 v003) |

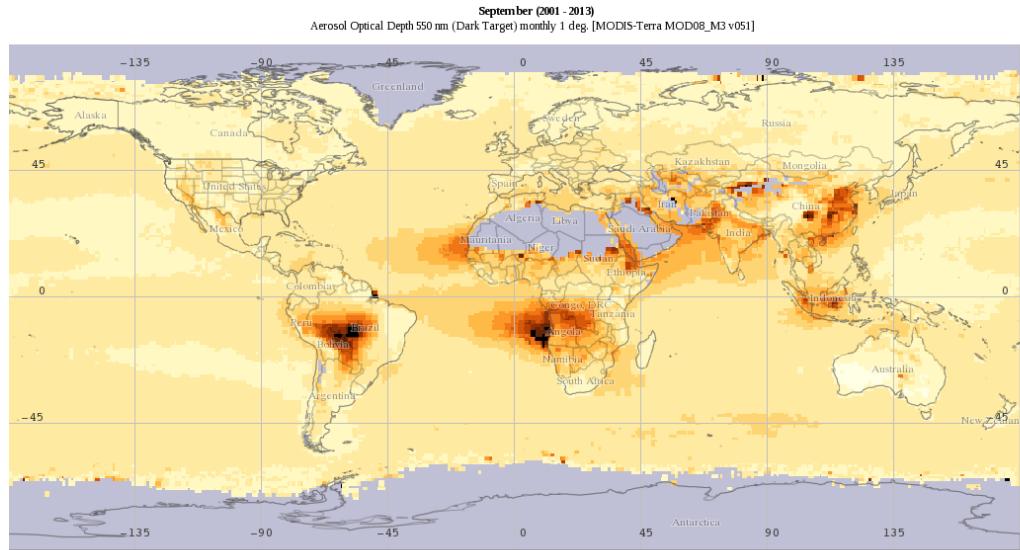


User-Defined Climatology



MODIS Monthly AOD

March, 2001-2013



September, 2001-2013

[Click Here to Repeat](#)

Comparison of aerosol regimes in March vs. Sept. over 2001-2013. (Courtesy Suhung Shen)

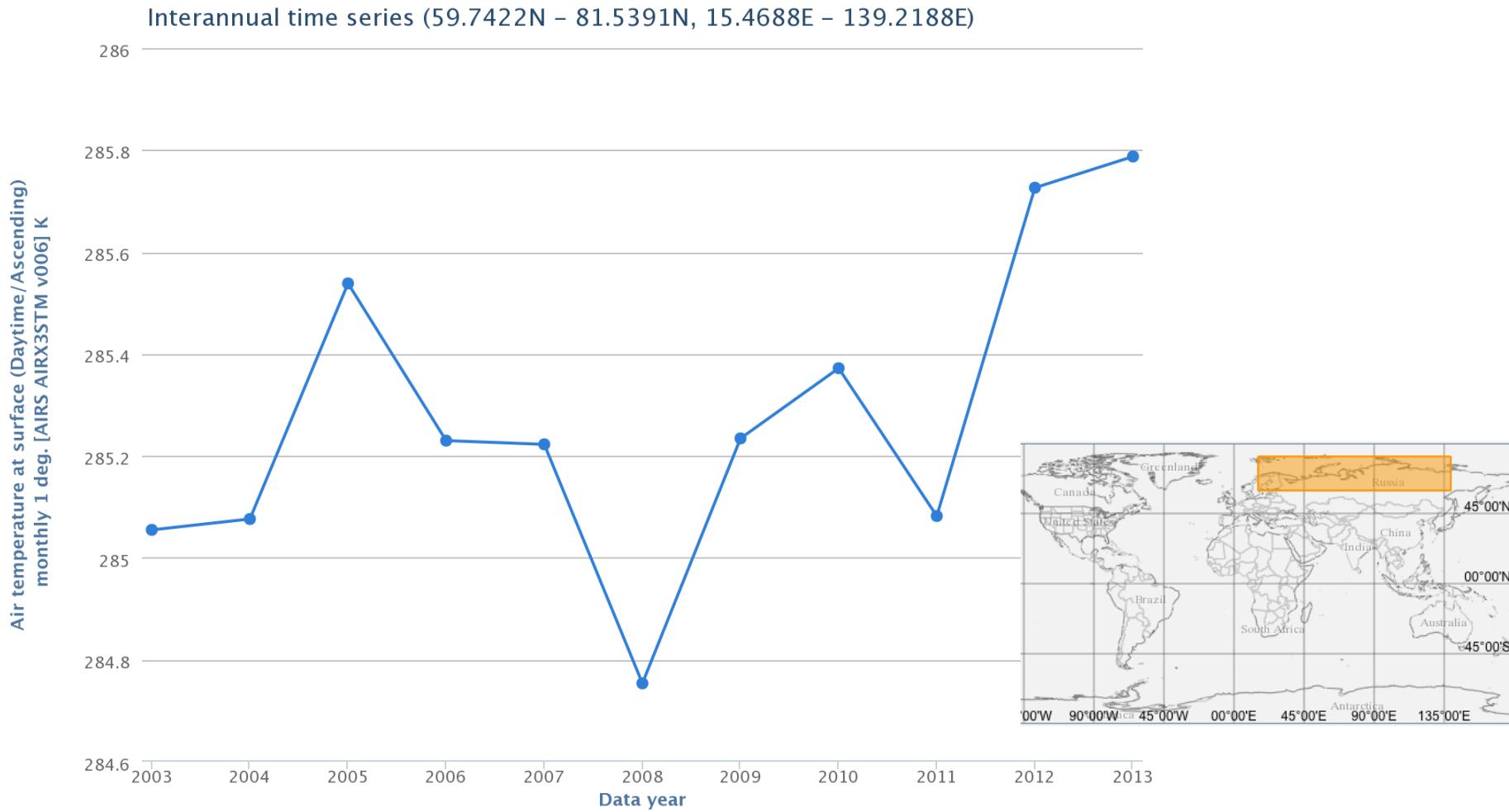


Seasonal Analysis: Interannual Time Series

- Available for Monthly data
- Plot the area average for <month> for the years <start> to <end>



Interannual Time Series Example



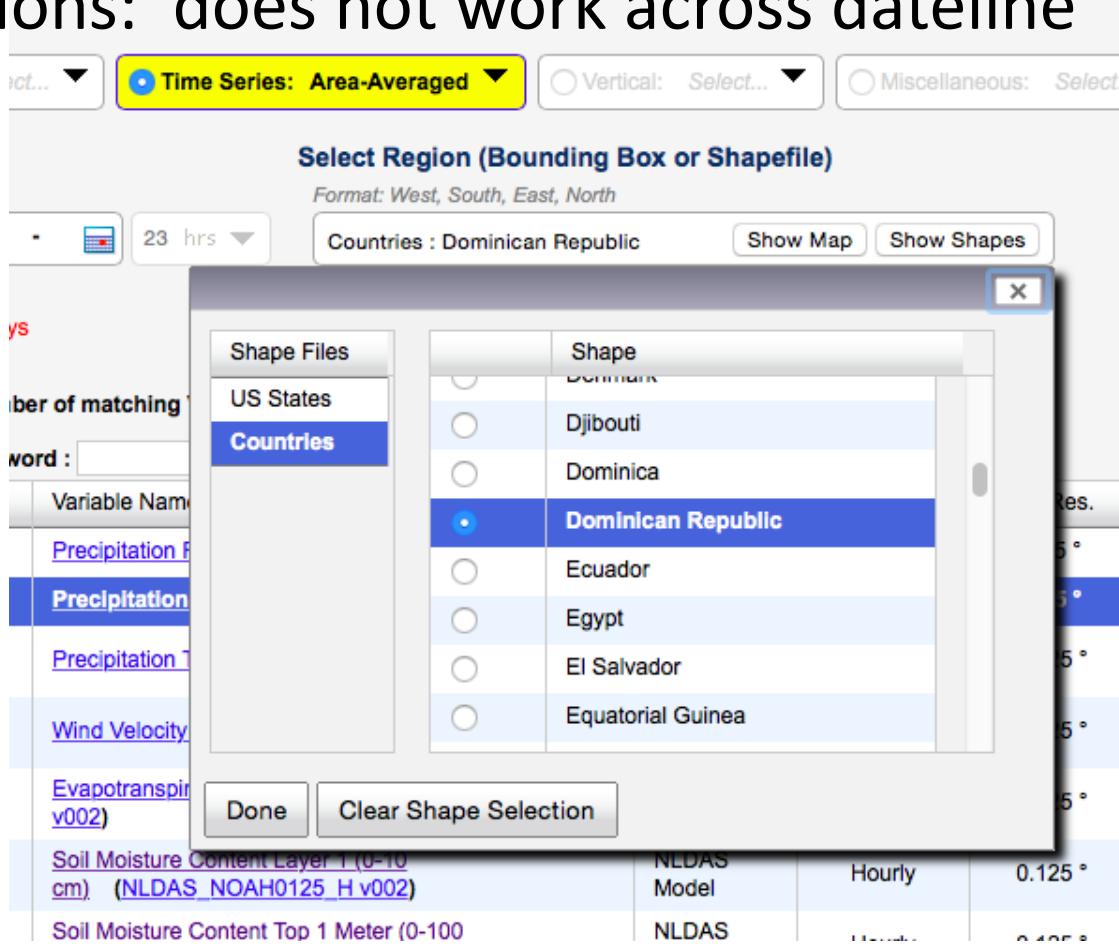
Strong summer (July) warming, on the order of 0.5K/dec during the past decade, is observed by AIRS over the permafrost of the Tundra region. (Courtesy Andrey Savtchenko)

[Click here to repeat](#)



Shapefile Support

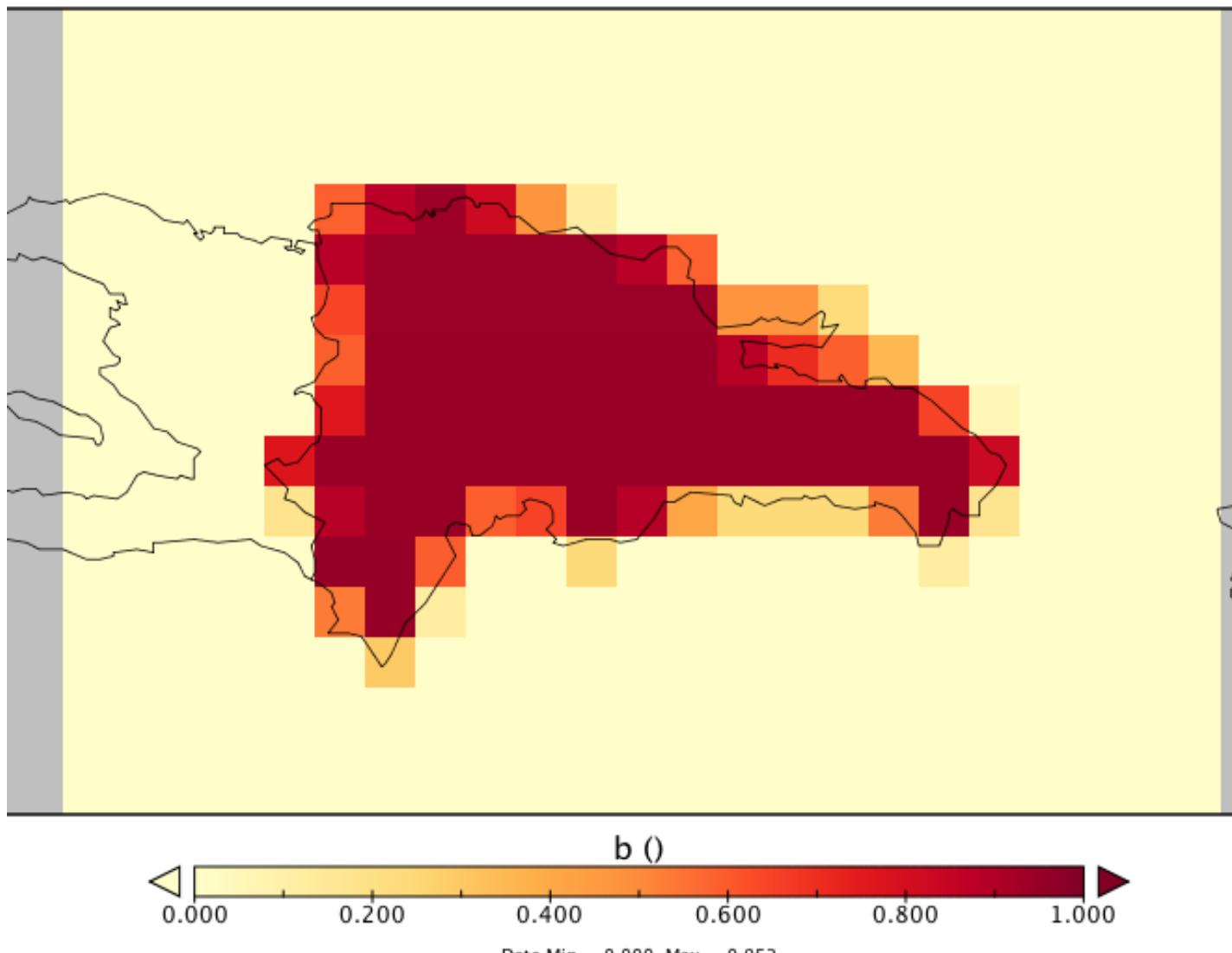
- Area-Averaged Time Series
- Coming soon...time-averaged map, histogram
- Limitations: does not work across dateline





Shapefile-based Area Averaged Time Series

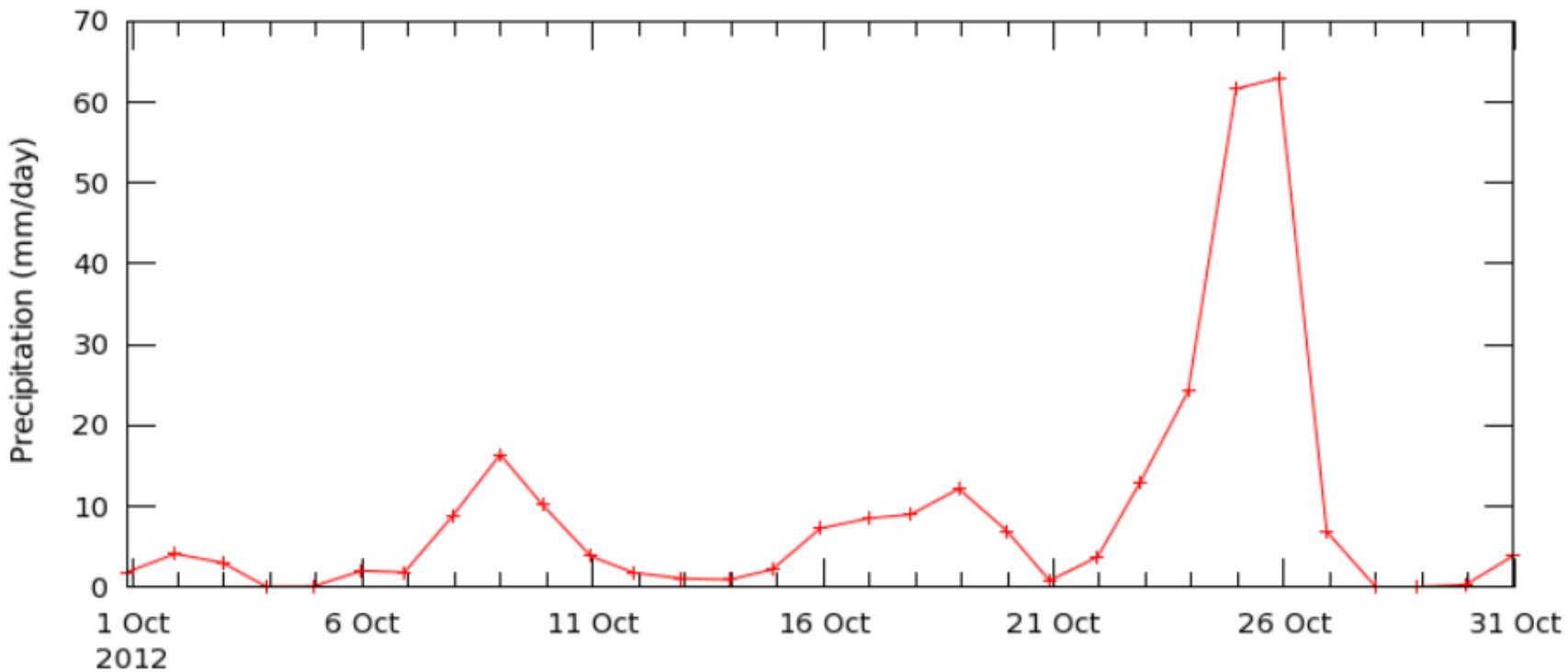
Compute average over area, weighted by % coverage by shape and $\cos(\text{lat})$





Shapefile-based Area Averaged Time Series

Time Series, Area-Averaged of Precipitation Rate daily 0.25 deg. [TRMM TRMM_3B42_daily v7] mm/day over 2012-09-30 22:30Z - 2012-10-31 22:29Z, Shape Dominican Republic

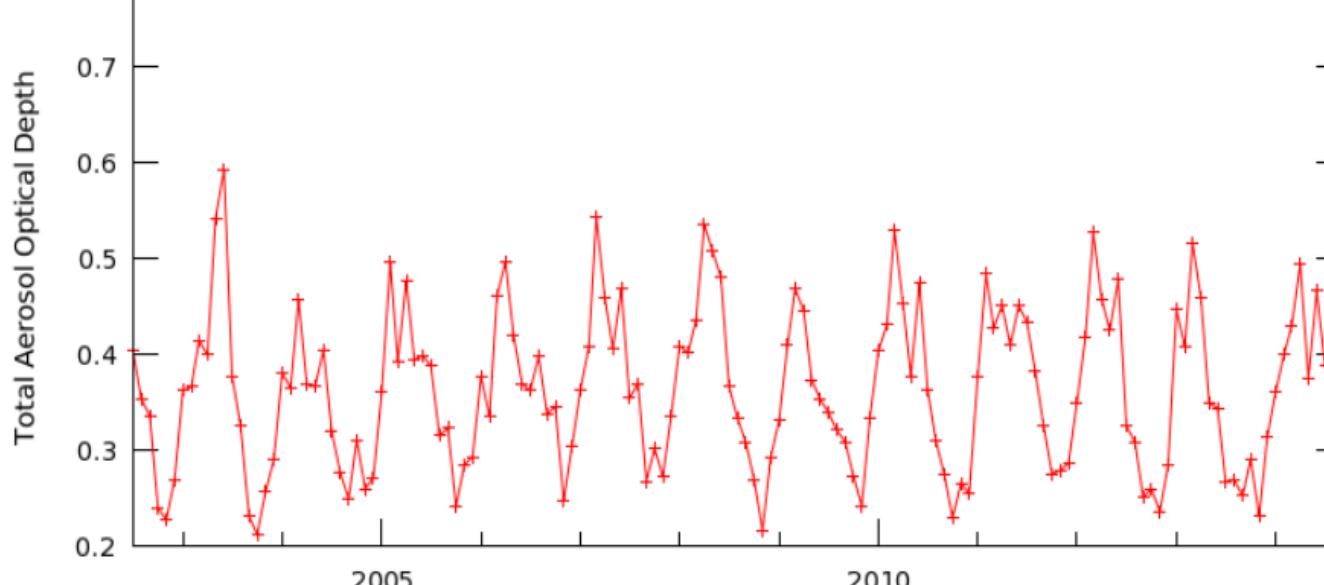
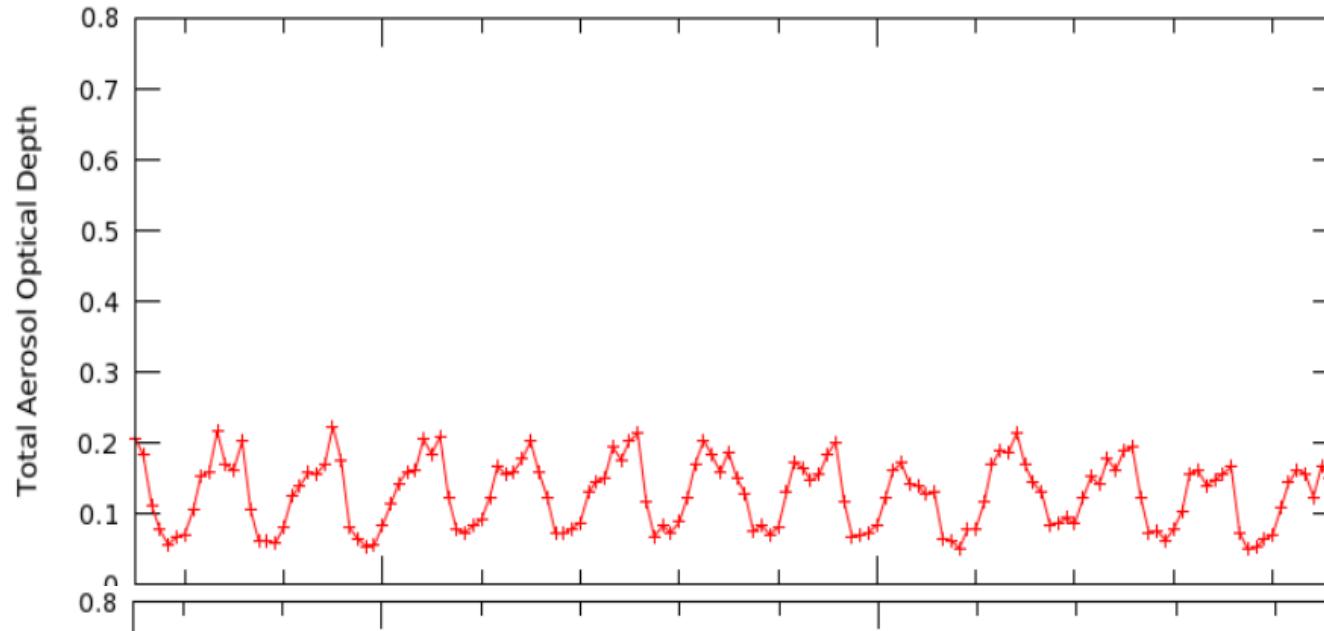


- Selected date range was 2012-10-01 - 2012-10-31. Title reflects the date range of the granules that went into making this result.

TRMM Rainfall for Oct. 2012, showing Hurricane Sandy landfall.
(Courtesy Zhong Liu)



Shapefile based Computation of MODIS-Terra Monthly AOD

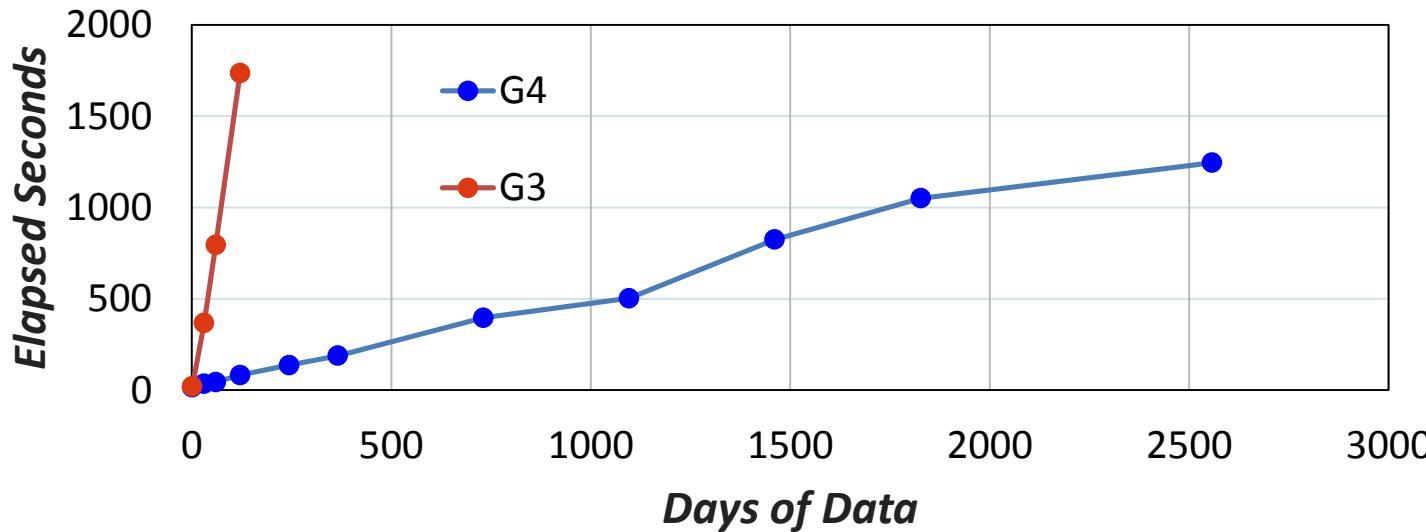


*Courtesy
Jennifer Wei*

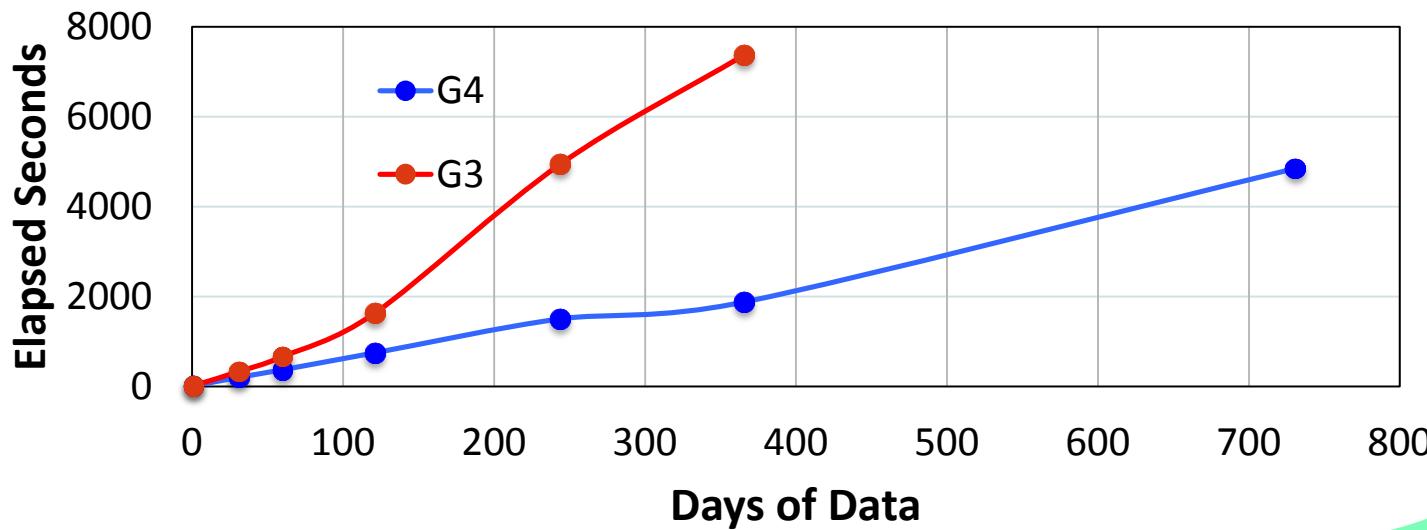


Giovanni 4 Performance

Time Averaged Map



Area-averaged Time Series





DISCUSS...



Features Still on the TO DO list

- Pre-computed Climatology (up next)*
- OMI Level 2G
- Level 2 data support
- Cross sections (Z-Lat, Z-Lon, Z-Time)
- Time series of area statistics
- Zonal mean
- Multi-variable plots (overlays)
- Web Coverage Service interface
- MyGiovanni: user-contributed color palettes, shapefiles, data, algorithms
- Geometric Mean
- Units conversion
- More download options (KMZ, more ASCII, batch)

Your input can help us prioritize them



Giovanni was designed for exploratory data analysis...

1. ...Should Giovanni evolve to support the Main Analysis Phase better?
2. What modifications would enhance “scientific rigor”?

